

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP03/04341

## A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl<sup>7</sup> H02M1/08

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl<sup>7</sup> H02M1/00-1/30, 7/42-7/98, G01R15/00-17/22, H01L23/56,  
25/00-25/16

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2003
Kokai Jitsuyo Shinan Koho	1971-2003	Toroku Jitsuyo Shinan Koho	1994-2003

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6236110 B1 (Mitsubishi Denki Kabushiki Kaisha), 22 May, 2001 (22.05.01), Column 7, lines 17 to 57; Fig. 4	1-3, 6, 9, 10, 27, 28, 30, 31, 35-37, 41
A	& JP 2000-353778 A Par. Nos. [0015] to [0017]	4, 5, 7, 8, 11-26, 29, 32-34, 38-40
Y	JP 8-194016 A (Fuji Electric Co., Ltd.), 30 July, 1996 (30.07.96), Par. Nos. [0023] to [0022]; Figs. 1 to 4	1-3, 6, 9, 10, 27, 28, 30, 31, 35-37, 41
A	(Family: none)	4, 5, 7, 8, 11-26, 29, 32-34, 38-40

☒ Further documents are listed in the continuation of Box C.
 ☐ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search  
30 June, 2003 (30.06.03)Date of mailing of the international search report  
15 July, 2003 (15.07.03)Name and mailing address of the ISA/  
Japanese Patent Office

Authorized officer

Facsimile No.

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## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2000-171491 A (Mitsubishi Electric Corp.), 23 June, 2000 (23.06.00), Full text; Figs. 1 to 15 (Family: none)	1-41
A	JP 2001-86768 A (Mitsubishi Electric Corp.), 30 March, 2001 (30.03.01), Full text; Figs. 1 to 15 (Family: none)	1-41
A	JP 5-223849 A (Toshiba Corp.), 03 September, 1993 (03.09.93), Full text; Figs. 1 to 5 (Family: none)	1-41



**SUPPLEMENTARY  
EUROPEAN SEARCH REPORT**

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
The supplementary search report has been based on the last set of claims valid and available at the start of the search.			
Place of search		Date of completion of the search	Examiner
<div>CATEGORY OF CITED DOCUMENTS</div> <div><div>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</div><div>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... &amp; : member of the same patent family, corresponding document</div></div>			